Alan F. Ciamporcero
Vice President

1275 Pennsylvania Avenue, N.W., Suite 400
Washington, D.C. 20004
(202) 383-6416

PACIFIC TELESIS.
Group-Washington

EX PARTE OR LATE FILED

July 25, 1996

DOCKET FILE COPY ORIGINAL

RECEIVED

JUL 2 5 1996

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

<u>**EX PARTE**</u>

William F. Caton
Acting Secretary
Federal Communications Commission
Mail Stop 1170
1919 M Street, N.W., Room 222
Washington, D.C. 20554

Dear Mr. Caton:

Re: CC Docket Nos. 96-45 and 96-98

Attached is a document containing algorithms for Pacific's Cost Proxy Model in response to a request by Anthony Bush and William Sharkey of the Common Carrier Bureau. In addition, we provide the following information: the fill factors in the cost Proxy Model include all services, both business and residential. Efficiencies in the residence loop are realized via the inclusion of all services. In wire centers where competition already exists fill factors are at lower levels. Please associate this material with the above referenced proceeding.

We are submitting two copies of this notice in accordance with Section 1.1206(a)(1) of the Commission's Rules.

Please stamp and return the provided copy to confirm your receipt. Please contact me should you have any questions or require additional information concerning this matter.

Sincerely,

Alan Ciamporcero

cc: (w/ attachments)
Anthony Bush
William Sharkey

No. of Copies rec'd 0+3

RECEIVED

JUL 2 5 1996

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Cost Proxy Model ©

Cost Engine Algorithms

Developed by : INDETEC International and Pacific Bell

Cost Proxy Model ©

The CPM© is an efficient, SAS based system that develops the costs for local telecommunication services. This is accomplished through the use of user supplied cost and engineering tables and commercially available customer related data (census, daytime population, terrain, wire center boundaries, and wire center information).

The CPM is broken into three major modules: Cost Engine, Customer Engine, and the Reporting Engine. This document will cover the algorithms used in the Cost Engine. These algorithms develop unit costs (per foot, per message, etc.) that are then applied to the information contained in the Customer Engine (total feet, total messages) to arrive at the cost of Universal Service, Unbundled Links, Unbundled ports, etc., for a specific geographic section of a serving territory (Wire Center, Census Block Group, Company, etc..).

Cost Engine Algorithms

The unit costs are developed using user supplied cost/engineering data along with CPM unit cost algorithms.

CPM Engineering/Cost Tables:.

- **A + B Cost file (AB_CST.CSV)** Capitalized cost of outside plant equipment.
- **Outside Plt Adj (Plant Adjustment) file (OSP_FCT.CSV)** Provides an adjustment to the capitalized value of cable plant based on the density value and terrain type.
- **Cable Size file (CBL_SIZ.CSV)** Given certain density zones, this table provides the average outside plant cable size used.
- **Other Inv (Investment) file (OTH_INV.CSV)** This is a file that contains those investment items driven only by lines (for example, terminal, drop, SAI).
- **Fill Level file (FILLS.CSV)** Provides the going forward actual plant utilization rates
- **Switch / IO (Interoffice) file (SIO_INV.CSV)** Switch and Interoffice investment by line, message, etc.

CPM Engineering/Cost Algorithms

Notation in algorithms is as follows:

(CPM CSV File name).(CSV file Variable)(CPM lookup variables))

where,

CPM CSV file name is based upon the first extent from the above listed data tables.

Copper Cable (Aerial, Buried, and Underground):

$UI_{tdoce} = [\text{AB\_CST.}A_{ce} + \text{AB\_CST.A\_OTHER}_{oc} + (\text{AB\_CST.}B_{ce} * \text{CBL\_SIZ.CBL\_SIZ}_{doc})] / \text{CBL\_SIZ.CBL\_SIZ}_{doc} / \text{FILLS.ACT\_FILL}_{do} * \text{OSP\_FCT.OSP\_ADJ}_{tdc}$

where,

UI=	Unit Investment,
t(TERR_TYP))=	N(ormal), M(edium), H(igh), W(ater),
d(DENS_TYP) =	Z1, Z2,…., Z7 ,
o(OSP_TYP) =	CF(copper Feeder), CD(Copper Distribution) ,
c(FRC) =	5C, 12C, 45C , and
e(ELEMENT) =	AER_CU (Aerial Copper), BUR_CU (Buried Copper), UGD_CU (Underground Copper).

Structure for Copper (Poles):

$UI_{tdofce} = \text{AB\_CST.}A_{tdfc} / \text{CBL\_SIZ.CBL\_SIZ}_{doc} / \text{FILLS.ACT\_FILL}_{do}$

where,

UI=	Unit Investment,
t(TERR_TYP))=	N(ormal), M(edium), H(igh), W(ater),
d(DENS_TYP) =	Z1, Z2,…., Z7 ,
o(OSP_TYP) =	CF(copper Feeder), CD(Copper Distribution) ,
f(FAMILY) =	DST (distribution), FDR (feeder) ,
c(FRC) =	12C , and
e(ELEMENT) =	POLES_CU (Poles for Copper Cable).

Structure for Copper (Conduit):

$UI_{tdofce} = \text{AB\_CST.}A_{tdfc} / \text{CBL\_SIZ.CBL\_SIZ}_{doc} / \text{FILLS.ACT\_FILL}_{do}$

where,

UI=	Unit Investment,
t(TERR_TYP))=	N(ormal), M(edium), H(igh), W(ater),
d(DENS_TYP) =	Z1, Z2,…., Z7 ,
o(OSP_TYP) =	CF(copper Feeder), CD(Copper Distribution) ,
f(FAMILY) =	DST (distribution), FDR (feeder) ,
c(FRC) =	5C , and
e(ELEMENT) =	COND_CU (Conduit for Copper Cable).

Fiber Cable (Aerial, Buried, and Underground):

$$UI_{tdoce} = [\text{AB\_CST}.A_{ce} + \text{AB\_CST}.A\_OTHER_{ce} + (\text{AB\_CST}.B_{ce} * \text{CBL\_SIZ}.CBL\_SIZ_{doc})] / \text{CBL\_SIZ}.CBL\_SIZ_{doc} / \text{FILLS}.ACT\_FILL_{do} * 4 * \text{OSP\_FCT}.OSP\_ADJ_{tdc} / [\text{AB\_CST}.A\_CAP_{e'=pair\_go,d} * \text{FILLS}.ACT\_FILL_{o'=pg,d}]$$

where,

UI=	Unit Investment,
t(TERR_TYP))=	N(ormal), M(edium), H(igh), W(ater),
d(DENS_TYP) =	Z1, Z2,…., Z7 ,
o(OSP_TYP) =	FF(Fiber Feeder) ,
c(FRC) =	85C, 812C, 845C , and
e(ELEMENT) =	AER_FO (Aerial Fiber), BUR_FO (Buried Fiber), UGD_FO (Underground Fiber).

Structure for Fiber (Poles):

$$UI_{tdofco} = \text{AB\_CST}.A_{tdfo} / \text{CBL\_SIZ}.CBL\_SIZ_{doc} * 4 / \text{FILLS}.ACT\_FILL_{do} / [\text{AB\_CST}.A\_CAP_{e'=pair\_gn,d} * \text{FILLS}.ACT\_FILL_{o'=pg,d}]$$

where,

UI=	Unit Investment,
t(TERR_TYP))=	N(ormal), M(edium), H(igh), W(ater),
d(DENS_TYP) =	Z1, Z2,…., Z7 ,
o(OSP_TYP) =	FF(Fiber Feeder),
f(FAMILY) =	FDR (feeder) ,
c(FRC) =	812C ,
e(ELEMENT) =	POLES_FO (Poles for Fiber), and
4=	number of fibers needed for Pair Gain system.

Structure for Fiber (Conduit):

$$UI_{tdofce} = \text{AB\_CST}.A_{tdfe} \;/\; \text{CBL\_SIZ}.\text{CBL\_SIZ}_{doc} * 4 \;/\; \text{FILLS}.\text{ACT\_FILL}_{do} \;/\; [\, \text{AB\_CST}.\text{A\_CAP}_{c'=pair\_gn,d} * \text{FILLS}.\text{ACT\_FILL}_{o'=pg,d} \,] / 3$$

where,

UI=	Unit Investment,
t(TERR_TYP))=	N(ormal), M(edium), H(igh), W(ater),
d(DENS_TYP) =	Z1, Z2,...., Z7 ,
o(OSP_TYP) =	FF(Fiber Feeder) ,
f(FAMILY) =	FDR (feeder) ,
c(FRC) =	85C ,
e(ELEMENT) =	COND_FO (Conduit for Fiber under 9kft), COND_FO9(Conduit for Fiber over 9kft),
4 =	number of fibers needed for a Pair Gain system, and
3 =	fiber cable capacity of conduit.

Pair Gain Systems:

$$UI_{dofce} = [\text{AB\_CST}.A_{ce} \,/\, [\, \text{AB\_CST}.\text{A\_CAP}_{od} * \text{FILLS}.\text{ACT\_FILL}_{od} \,]] + [\, \text{AB\_CST}.B_{ce} \,/\, \text{FILLS}.\text{ACT\_FILL}_{o'=pi,d'=*}]$$

where,

UI=	Unit Investment,
d(DENS_TYP) =	Z1, Z2,...., Z7 ,
o(OSP_TYP) =	PG(Pair Gain),
f(FAMILY) =	FDR (feeder) ,
c(FRC) =	257C , and
e(ELEMENT) =	PAIR_GN (Pair Gain).

Switch:

$UI_{solue} = \text{SIO\_INV}.\text{U\_INV\_AC}_{solue}$

where,

UI=	Unit Investment,
s(SW_TYP) =	5E, R5E, D100, RD100 ,
o(OSP_TYP) =	FF (Fiber Feeder), CF (Copper Feeder), * (all) and
l(L_LOWER) =	0,
u(L_UPPER) =	0, and
e(ELEMENT) =	SW_LT, SW_MSG_F, SW_MOU_F, TM_MOU, TM_MSG

OR

UI=	Unit Investment,
s(SW_TYP) =	*(all) ,
t(TECH_TYP) =	*(all) , and
l(L_LOWER) =	Integer (lower limit of switch line size lookup),
u(L_UPPER) =	Integer (upper limit of switch line size lookup), and
e(ELEMENT) =	SWITCH

Other Investment:

$UI_{ed} = \text{OTH\_INV}.\text{U\_INV\_AC}_{ed}$

where,

UI=	Unit Investment,
e(ELEMENT) =	DROP, TERMINAL, SAI , and
d(DENS_TYP) =	Z1,……,Z7